Western Well Tool's Microhole Drilling Tractor

by
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Western Well Tool

DT337-Microhole Drilling Tractor Project Status

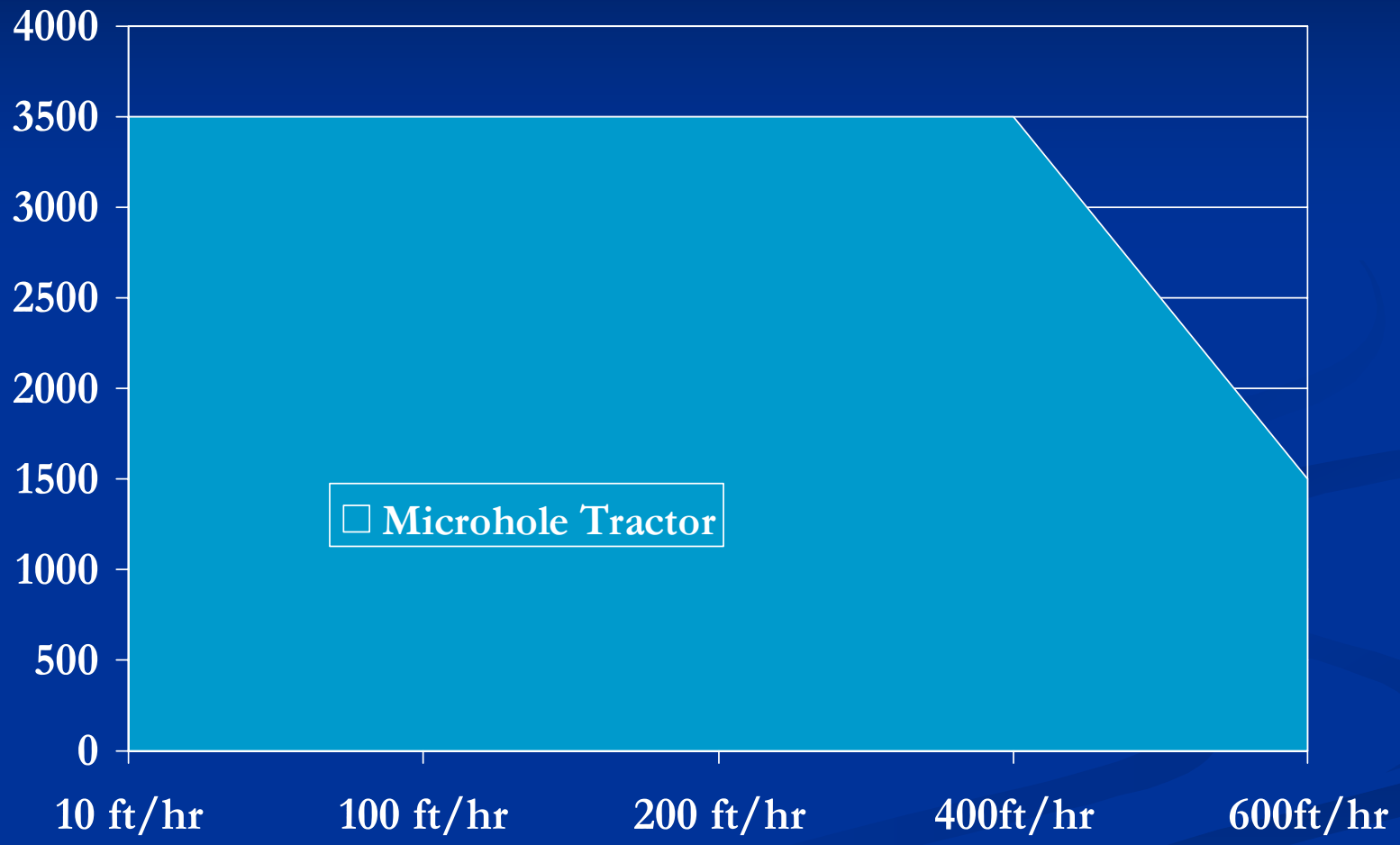
- Design Completed
- Manufacturing underway, long lead items tracking on schedule
- Planning for Demonstration wells - Trip to Alaska August 24, 2006
- Three Demonstration Wells: December 2006- March 2007

DT337 - Microhole Drilling Tractor Plus

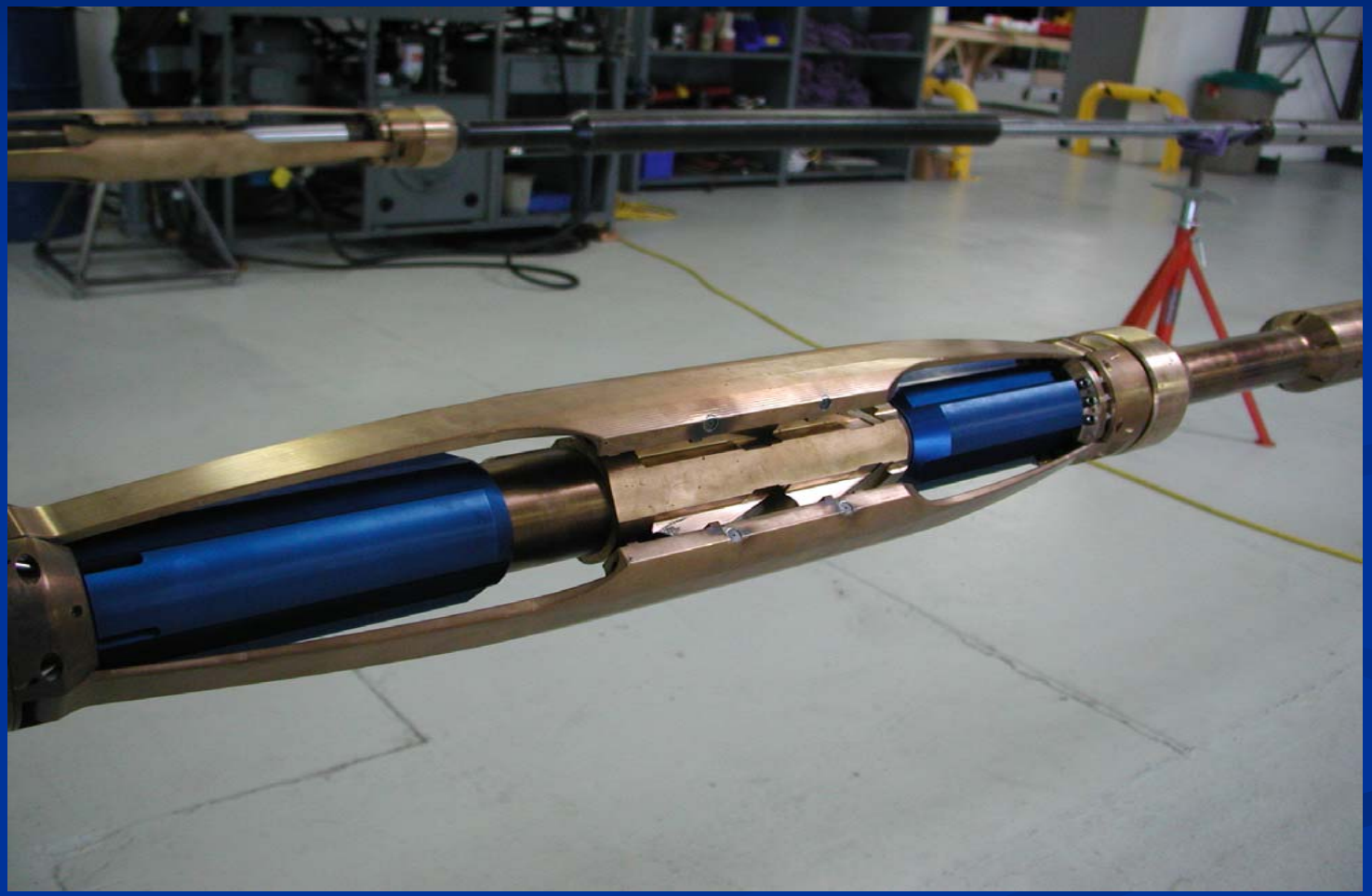
DT337 -Microhole Drilling Tractor Plus Specification

Length	23-ft*
Tractor OD (Gripper Collapsed)	3-3/8-in.
Maximum Expansion	4.2-inch
Tractor I.D.	0.75 inch
Maximum Flow rate	84 gpm
Maximum Pull (listed by OD)	3500-4000 lbs
Speed Range	drilling 50-150 ft/hr
Maximum dogleg drilling	15-deg/100 ft
Maximum dogleg sliding	55-deg/100 ft
Tensile Strength	40,000-lbs
Maximum Operating Temperature	300-F
Maximum Operating Pressure	16,000-psi
Controls direction	On-off, Speed,
Materials	CuBe, Inconel, SS

DT337 -Microhole Drilling Tractor Plus Performance



Roller-Toe Gripper



Microhole Tractor Shaft Manufacture

WWT's Additional Project Contribution to Microhole Project

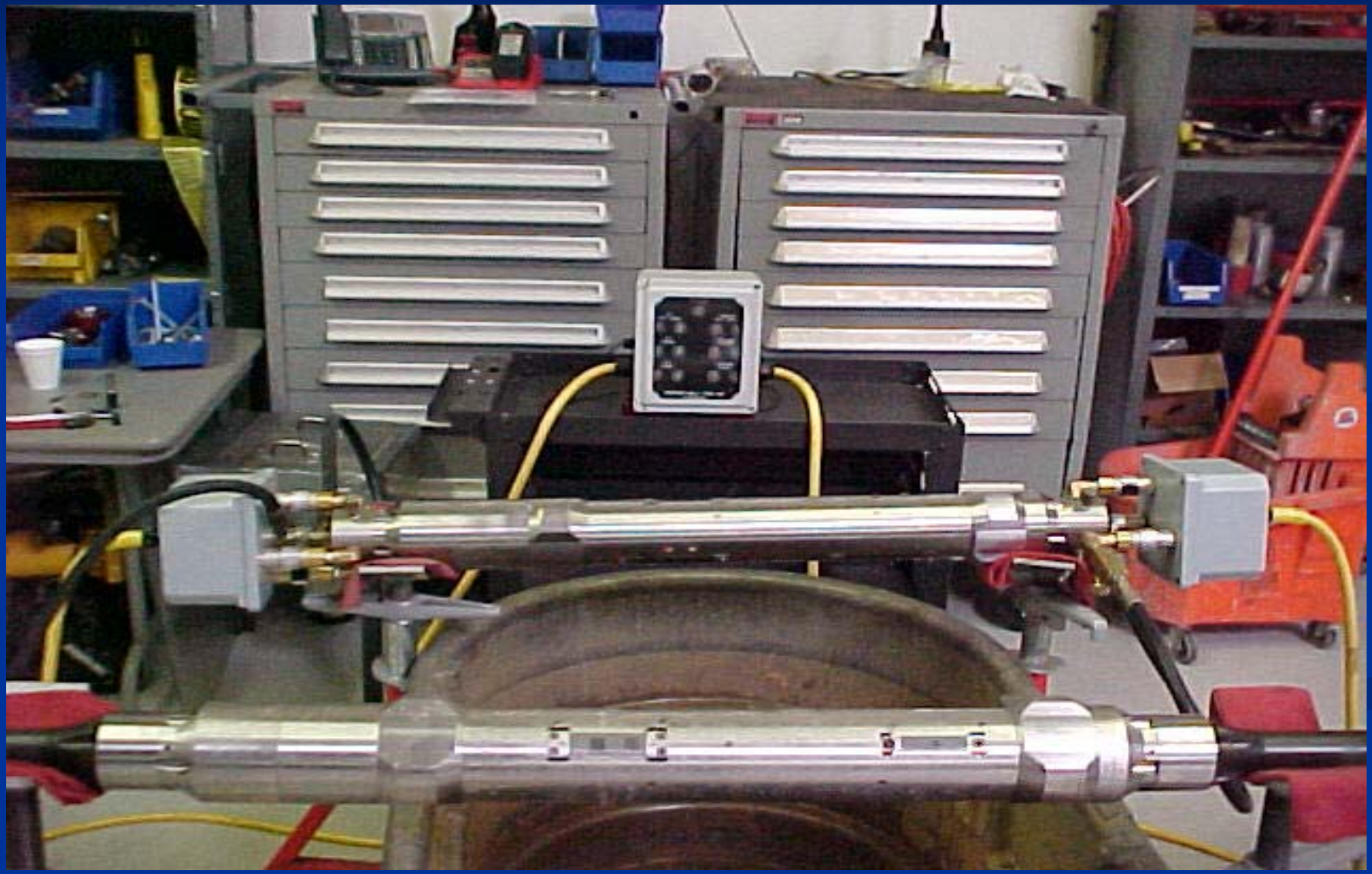
- Manufacture of second complete Microhole Drilling Tractor to facilitate field demonstration
- Identify and develop alternate shaft supplier to provide improved schedule
- Development of portable field test equipment
- Two Fatigue characterization programs for Gripper elements
- Operations Analyses
- Financial contribution to project at 59%
- Product Improvements in development

Gripper Fatigue Characterization

Roller-Toe Gripper Summary

- Open Self Cleaning design that operates well in mud
- Fatigue tested to over 115,000 cycles (equivalent to walking 59 miles) before failure, with loads equivalent one gripper pulling, two slipping.
- Grips in all formations from shale to Granite (compressive strength 300-30,000-psi)

Microhole Tractor Test Fixture



WWT's Coming Tractor Features

- High Expansion (ERG) Tractor Grippers
- Improved Start Stop System

Western Well Tool

Drilling Tractors